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ABSTRACT

A research project was designed to test two hypotheses concerning the teaching of music notation: (1) the overhead projector would prove superior to the chalkboard as a teaching aid; and (2) the use of the overhead projector would cause students to retain knowledge better and score higher on standardized music tests. The study involved 93 students from 4 fourth grade classes in a suburban school in New Jersey. Two classes comprised the experimental group which was taught music notation fundamentals using an overhead projector. The other two classes, which formed the control group, were taught the same music fundamentals using a chalkboard. Prior to the 5-week instruction period, a survey of music in the home and musical preferences was conducted and a pretest on music notation fundamentals was given. Posttests on music notation fundamentals were given at the end of the instructional period. Data analysis indicated that those taught using a chalkboard showed greater improvement and better performance on tests than those taught using an overhead projector, contradicting both hypotheses. (BZ)

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A COMPARISON OF THE EFFECTIVENESS OF OVERHEAD PROJECTION AND CHALKBOARD IN TEACHING MUSIC NOTATION

BY

DAVID HUNT

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A COMPARISON OF THE EFFECTIVENESS OF OVERHEAD PROJECTION AND CHALKBOARD IN TEACHING MUSIC NOTATION

A Research Project
Presented to
the Faculty of the Graduate School
William Paterson College

In Partial Fulfillment
of the Requirements for the Degree
Master of Education

by

David Hunt

December, 1976

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No student can take all the credit for his success and accomplishments. For without assistance and encouragement few individuals can function effectively.

For their patience and understanding I wish to express deepest thanks to my dear wife, Joni, and my sons, Kevin and David-Alan.

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Last but not least, a word of thanks to the lower intermediate students of Heights School, Oakland, New Jersey, who so willingly and heartily entered into this project as subjects for the study.

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Hunt, David. "A Comparison of the Effectiveness of Overhead Projection and Chalkboard in Teaching Music Notation." M. Ed. dissertation. Wayne, New Jersey: William Paterson College, 1976.

I. Title - A Comparison of the Effectiveness of Overhead Projection and Chalkboard in Teaching Music Notation.

A. Date and Place Completed - William Paterson College, Wayne, New Jersey, December, 1976. M.Ed. dissertation.

II. Hypothesis: In the instruction of cognitive aspects of elementary classroom music, the overhead projector is superior to the chalkboard.

Minor Hypothesis: Subjects taught the musical staff, treble clef, notes and note values with overhead projection will retain knowledge and score higher on standardized music tests than those subjects taught the same material using chalkboard.

III. Methods and Procedures

A. Subjects - Four lower intermediate classes (grade 4), Heights School, Oakland, N.J. Ninety-three subjects, suburban backgrounds, separated into 2 experimental and 2 control groups.

B. Design of Study - Using overhead projection with experimental groups and chalkboard with control groups, a 5 week unit on music notation fundamentals was pursued, including the following:
1. Survey of music in the home and musical preferences.
2. Pre-test on music notation fundamentals.
3. Demonstrations of drawing staff, treble clef, notes and note values, revealed in sequence.
4. Post-test.
5. Analysis of results.

C. Materials - Pre and post-tests adapted from TEMAC Programmed Learning Materials: Musical Notation by John Batcheller. (New York: Encyclopaedia Britannica Press, 1964).

Bell and Howell standard overhead projector and acetate overlays made especially for experiment.

Chalkboard and chalk.

IV. Analysis of Data

A. Affective survey: indicates type and quantity of music in homes of subjects, and individual tastes.

B. Findings related to:
Attendance - averaged 95%.
Weather - mostly clear and colder than normal.
Interruptions - little noticeable effect.

C. Analysis of test scores: increase from pre to post-test.
1. Experimental groups averaged 298% increase.
2. Control groups averaged 385% increase.

V. Conclusions

A. Major hypothesis rejected.
B. Minor hypothesis rejected.
C. Limitations:
1. Class sizes relatively small.
2. School closings interrupted continuity.

D. Comparison of averaged mean test scores indicate those taught by chalkboard showed greater improvement than those taught by overhead projection. This suggests overhead projection may not be best in teaching music notation fundamentals on elementary level. However, limitations of this study must be considered. Results indicate suggestions for further research: conducting same study elsewhere for comparison; conducting same study on secondary level; and conducting research on suitability of overhead projection to elementary level.

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Chapter 1

INTRODUCTION

> Music, the greatest good that mortals know
> And all of Heaven we have below.[1]

"Music makes me so very happy"; it is an elementary classroom music teacher's dream to hear these words, for that is why elementary classroom music education exists.

Music in the elementary classroom means providing a climate for an aesthetic sense to grow. Musical aesthetics on the elementary level means purely and simply enjoyment -- having a good time -- learning to like music.

The elementary classroom music teacher is in a situation that is affective to a greater degree, and cognitive to a lesser degree, for his ultimate goal is to provide his subjects with an opportunity to develop a sense of musical aesthetics, which will enrich their lives as long as they live.

While music is at this stage highly affective, there

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[1]Joseph Addison, "Song for St. Cecilia's Day" The Golden Book of Quotations (New York: Golden Press, 1964), p. 41.

are, nevertheless, cognitive aspects of an elementary classroom music program. Subjects should have a working knowledge of such cognitive areas of music as the staff, treble clef, notes and note values, before moving on to music studies in secondary education.

Since overhead projection has been used with success in many cognitive areas of the elementary curriculum, it is prudent and timely to undertake a study of the effectiveness of overhead projection in the aforementioned areas of musical cognition.

PURPOSE OF THE STUDY

The purpose of this study is to determine the advantages, if any, in utilizing overhead projection as opposed to using the chalkboard in teaching cognitive aspects of elementary classroom music. Though many studies of the utilization and advantages of overhead projection have been made, few have concerned themselves with the music curriculum.

This study will evaluate the effectiveness of the overhead projector in teaching of cognitive areas of music by comparing test results of those subjects taught by this method with test results of those subjects taught cognitive areas of music by the chalkboard method.

Major Hypothesis

In the instruction of cognitive aspects of elementary classroom music, the overhead projector is superior to the chalkboard.

Minor Hypothesis

Subjects taught the musical staff, treble clef, notes and note values with overhead projection will retain knowledge and score higher on standardized music tests than those subjects taught the same material using the chalkboard.

SIGNIFICANCE OF THE STUDY

When engaged in musical activities, one often hears from those around him, "I wish I could read music," or "I wish I knew the notes." From the quadrivium of Medieval times to the present, music has been considered basic to an education. Musical development means not only appreciation, but creative ability as well, a knowledge of the staff, treble clef, notes and note values, and how to read and interpret them. Of the shortcomings of our culture, perhaps one of the most unfortunate is that many enjoy music and want to participate in creation of it, but few have a working knowledge of notes and other elements. While many can

recognize a musical theme when it is played, few are sufficiently literate in music that they can identify the same theme as it looks in print.

Presenting a good, clear picture of musical elements is important to students. One of the objectives of this study is to find the best -- and clearest -- picture of music notation fundamentals to present, so that students may retain the knowledge, and achieve lasting "musical literacy."

WHAT THIS STUDY PROPOSES

This study proposes to observe and compare test results of lower intermediate subjects who have been taught the musical staff, treble clef, notes and note values, using overhead projection with test results of subjects who have been taught the same music fundamentals using the chalkboard.

DEFINITION OF TERMS

For the purpose of this study the following terms are defined as:

Overhead projector - a device for showing images that have been written on transparent material.

Transparency - a sheet of transparent film.

Overlay - a series of transparencies in which one illustration is laid upon another.

Chalkboard - slate board used for illustrations drawn with chalk.

Lower intermediate classes - fourth grade classes.

ORGANIZATION OF REPORT

Chapter 1 discusses the purpose of the study, states major and minor hypotheses, considers the significance of the study, describes what the study proposes, defines terms, and gives the organization of the report. Chapter 2 reviews literature related to the study. Chapter 3 presents the methods and procedures used. Chapter 4 discusses the analysis of the data. Chapter 5 presents major conclusions, compares results with findings from earlier research, gives implications, suggestions for further research and a concluding statement.

Chapter 2

REVIEW OF THE LITERATURE

An abundance of literature has been written in recent years on audio-visual materials for schools in general, and on overhead projection in particular. This is due to the growth and proliferation of audio-visual equipment use in schools, beginning with the close of World War II.

A product of the present era in education, audio-visual devices are the teaching tools of our times, just as the hornbook and sampler were teaching tools of their era. With the abundance of audio-visual equipment available for use in today's education, there is also an abundance of literature and reference material on the proper and judicious use of the educational media at hand.

Educational media came into general use during the 1950's and grew at a steady pace to the present time. As usage of audio-visual aids, as they have been known since their inception, proliferated, devices also became increasingly sophisticated. In education today, media devices of

great electronic sophistication and complexity can be found. Videotape lessons are not uncommon, nor are computer-programmed curricula on a great variety of subjects, many of which are self-taught via the use of the most ingenious types of electronics.

Concurrent with the rise in popularity of educational media, great amounts of related literature came into being, ranging from "how to" type of instructional books and manuals, to a number of philosophic works on the implications of media for modern humanity. Textbooks, manuals, instruction booklets, research studies, monographs, treatises and dissertations abound in the field, and this chapter will explore some of the literature on educational media in general, with emphasis on works dealing with overhead projection.

GENERAL RESEARCH IN AUDIO-VISUAL EDUCATION

The decade 1940 - 1950 saw the use of audio-visual materials and methods of instruction amplified by wartime needs of U.S. Armed services and related defense industries. Stimulated by needs of a nation at war, much impressive evidence on the effectiveness of audio-visual education emerged. The period during and after the war saw transfer of wartime audio-visual instruction methods not only to

educational settings, but also to the advertising and industrial fields in general. Concurrently, a number of professional associations were founded, including the Educational Film Library Association and the Division of Audio-Visual Instruction of the National Education Association. Professional publications such as Educational Screen and Audio-Visual Guide began to appear.[1]

The study of the production, use and theory of audio-visual education, including the recent emphasis in programmed instruction, has unquestionably strengthened the quality of education. It has served to remind everyone concerned with education of the importance of sequential presentation, logical planning, strategic use of a rich variety of audio-visual stimuli, follow-up, testing, repetition, relevancy, motivation, and individual differences, all factors whose importance in the learning process have long been recognized by educators. Attention to audio-visual methods of instruction has also helped refocus upon the objectives of education and nature of the curriculum, and has contributed to enlarging the mainstream of thought

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[1]Charles F. Hoban and Robert W. Wagner, "Audio-visual Education," Encyclopedia Americana (New York: Americana Corp., 1975), II p. 670.

about communication as a basic and all-concompasing study of human behavior.[2]

The past twenty years have witnessed the development of new means of communication which have exerted a tremendous influence on professional behavior and leisure time; although still regarded with some suspicion by the older generation, the various media have become to the younger generation part of their way of life.[3]

New methods of visual and oral communication call for exploitation in the classroom. If not, the child will learn more outside the classroom than within its four walls. Organization of the education process in schools is being transformed by individualized learning, team teaching, and the like; the teacher begins to look like a professional manager.[4] He must make discriminate and prudent choices among the great variety of media options open to him, and utilize those which will be of optimum value to his students in the acquisition and retention of knowledge, whatever the

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[2] Ibid., p. 674.

[3] Centre for Educational Research and Innovation, "Educational Technology: the Design and Implementation of Learning Systems, 1970 Report." (Leiden, Netherlands: Organization for Economic Cooperation and Development, 1971), p. 11.

[4] Ibid., p. 7.

specific subject.

Of the plethora of media stimuli about us in this contemporary world, McLuhan[5] states in what he refers to as "poetic imagery":

> Today in our cities,
> most learning occurs outside the classroom.
> The sheer quantity of information conveyed by
> press-mags-film-TV-radio
> FAR EXCEEDS
> the quantity of information conveyed by
> school instruction & texts.
> This challenge has destroyed
> the monopoly of the book as a teaching aid
> & cracked the very walls of the classroom,
> so suddenly,
> we're confused, baffled.[6]

The medium itself is the message, according to McLuhan, and the above quoted remarks in verse-like form were taken literally -- including punctuation, ampersands, and phrases in capitals -- from his work on poetic imagery and auditory imagination.

From the aforementioned opinions it is clear that the media revolution is upon us; and it affects lives of students -- and the population in general -- not only within the four walls of the school but in the outside world as well. Vast amounts of students need to be educated;

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[5]Marshall McLuhan, Hot & Cool, (New York: The Dial Press, Inc., 1967), p. 110.

[6]Ibid., p. 112.

knowledge must be imparted on a great multitude of subjects. With the recognition of students' needs on a more individualized basis, the job of education becomes increasingly complex. Hence the need for application of teaching machines, programmed instruction and instructional technology becomes obvious. It is proper and timely for those in education to investigate and experiment, to discover the most prudent and effective ways of using modern educational technology.

STUDIES IN OVERHEAD PROJECTION

Availability of felt or nylon tipped pens, grease pencils, colored chalk, and low cost acetate sheets and rolls, along with commercially prepared materials have combined to make the overhead projector a popular and familiar teaching aid. Overhead projection is a valuable instructional tool; the overhead projector has many classroom applications: in languages, arts, sciences, sociology, and virtually every field of study.

In recent years, a number of research investigations have been conducted on use and effectiveness of overhead projection, and most have concluded that this device has been effective and useful as a teaching tool. These studies were conducted on both college and secondary levels.

A synopsis of various studies follows.

An investigation was done by Porreca[7] to determine whether overhead projection would be more effective than programmed textbooks in introducing economic concepts to students of various levels of reading comprehension, reading speed, listening comprehension, mental ability, and socio-economic background. Using The Free Enterprise System[8] programmed textbook as the source, the investigator constructed a number of overhead projector transparencies and used them in teaching an experimental group. A control group was presented the same economic concepts using the programmed text. Post-test scores revealed retention was statistically higher for the overhead projector-instructed group. Findings were statistically significant beyond the .05 confidence level.[9]

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[7]Anthony G. Porreca, "A Comparison of the Effectiveness of an Overhead Projector Presentation and a Programmed Textbook Presentation in Economic Education" (Ed.D. dissertation, Boston University School of Education, 1971), pp. iv, v.

[8]Keith Lumsde., The Free Enterprise System, the American Economic Series, Book I. (Palo Alto, California: Behavioral Research Laboratories, 1963).

[9]Porreca, Op. cit., p. 126.

In another research study, Chance[10] sought to determine whether overhead projector transparencies would be more effective and acceptable to teachers and students than time-proven chalkboard drawings in teaching a descriptive geometry course at the University of Texas. A standardized pre and post-test was administered to 105 students. Chance's study provided some recognition of the advantages of using overhead projection. Some of his conclusions pertinent to this study were: (1) approximately fifteen minutes per sixty-minute class lecture could be saved by the transparency medium over a comparable chalkboard lecture, (2) although differences in daily drawing and quiz grades were not statistically significant, there were higher grade averages favoring the transparency group, (3) seventy per-cent of the questions asked during the instructional period were in the transparency group, (4) the participating faculty preferred to engage in transparency demonstrations rather than chalkboard demonstrations, and (5) there was a noticeable improvement in final grades of transparency-

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[10]Clayton W. Chance, "Transparencies in Teaching Engineering Descriptive Geometry," USOE Research Grant No. 741023.09. (Austin, Texas: University of Texas, 1960), p. iii.

taught classes compared with chalkboard-taught classes.[11]

Another project investigated overhead projection accessories applicable to physics. Purpose of this study by Eppenstein[12] was to show specific ways in which overhead projection can be used in physics lectures. The report also indicated application of various projection techniques such as motorizing the projector, tracks left by rolling balls upon the projected acetate sheet, and shadow-projecting models of various types.[13]

A study by Sleeman[14] compares the effectiveness of three teaching techniques, overhead projection, programmed textbooks and conventional methods for teaching dictionary skills. Sleeman's study stated "There will be no significant difference in achievement of subjects taught by these methods of teaching dictionary skills." This null hypothesis was statistically significant and validated. Sleeman

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[12]Walter Eppenstein, "The Overhead Projector in the Physics Lecture," National Science Foundation (Troy, New York: Rensselaer Polytechnic Institute, 1962), p. 1.

[13]Ibid., pp. 14-29.

[14]Phillip J. Sleeman, "A Comparison of the Relative Effectiveness of Overhead Projection, Teaching Programs and Conventional Techniques for Teaching Dictionary Skills" (unpublished Ed.D. dissertation, Boston University, 1966), p. 111.

also reported no statistically significant differences in retention of material among the three methods. But the overhead projector presentation which Gleeman noted provided the greatest amount of learning and showed the highest retention of materials measured over a six-week period.[15] The results of the programmed learning presentation indicated that gain in material learned was not as effective as with lessons taught by overhead projection, but was more effective than conventional presentation.[16] The retention of material did not appear as high in most cases in the conventional presentation as with the other presentations.[17]

The purpose of Crosby's[18] study of the feasibility of adopting overhead projection in technical education was to determine visualizing capability of overhead projection in place of chalkboard and chalk in technical classrooms and laboratories. Results indicated that student motivation increased and creative impulses were aroused. By using

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[15] Ibid., p. 112.

[16] Ibid., p. 113.

[17] Ibid.

[18] William R. Crosby, "The Feasability of Adopting the Overhead Projector in Technical Education in the Rochester Technical High School," Audio-Visual Communication Review, XIV, No. 2 (1966), p. 273.

overhead projection, each topic considered in greater depth, and new topics could be added. Crosby concluded that for secondary school technical students overhead projection increased the depth of learning and decreased time required to teach a given subject.[19]

From the above-reported investigation, it is evident that overhead projection is effective as a teaching tool. Almost all of the aforementioned studies reported a trend in student achievement favorable to use of the transparency medium when compared to other media. Additional advantages were found in economical use of instructional time and preinstructional preparation of materials.

SUMMARY

A great abundance of literature on media in general, media in education, programmed instruction, educational technology, and audio-visual aids has been written in recent years. Likewise a number of studies on overhead projection in particular have been conducted in this decade and the last. The media revolution in the outside world as well as in the classroom has resulted in profound changes in modern life, only one of which is a great proliferation of

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[19] Ibid.

knowledge and information of ever-increasing complexity, to the point where educators must make use of media and modern educational technology in order to impart that knowledge and information effectively.

A number of specific studies in overhead projection have pointed to its effectiveness in classroom use. Favorable trends in student achievement can be noted, and additional advantages can be found in saving the instructor time in preparation of instructional materials, as well as economical use of demonstration time in the classroom.

Because of the concurrent explosions of media and information in this modern age, it is incumbent upon the educator to investigate and discover the most efficient methods of using technology, in order to best fulfill his purpose.

Chapter 3

METHODS AND PROCEDURES

Purpose of the Study

This study proposes to determine advantages, if any, in utilizing overhead projection as opposed to using chalkboard methods in teaching cognitive aspects of elementary classroom music. Although much research has been devoted to the use and advantages of overhead projection in other cognitive studies, little research has been done in application of overhead projection to teaching of music.

Two experimental groups of subjects taught music fundamentals including the staff, treble clef, notes and note values using an overhead projector will be tested using standardized tests. Two control groups, taught the same music fundamentals using chalkboard methods will also be tested. Comparison of results will show whether those subjects in the experimental groups, who were taught with overhead projection will exhibit better retention of data, and consequently score higher on tests than those subjects taught using chalkboard methods.

SUBJECTS USED IN STUDY

For the purpose of this study the entire lower intermediate student body of Heights Elementary School, Oakland, New Jersey, was used. Subjects are divided into four classes, two of which were used as experimental groups, and two of which were used as control groups. In addition are 8 special education students, who are diagnosed as neurologically impaired, who attend music class with the others on an integrated basis.

The subjects are average students from an average suburban town in northern New Jersey. Most come from middle-class homes, most have both parents working.

Selection of Background Data

An affective survey was created and conducted especially for this study (see accompanying illustration, Table 5.)

Results of the survey indicate of the 93 homes represented 45 have a piano or organ, in at least 43 homes it is played regularly, 55 homes have members of the family who play other instruments, 17 homes have members of the family who play in bands or orchestras, 27 homes have members of the family who sing regularly in choirs or other singing groups, 72 homes have phonographs which are used regularly to hear music, 81 homes have television sets on which

musical programs are watched regularly, and 86 homes regularly use the radio to listen to music. Of the 93 homes, 33 have at least one member of the family studying music privately, and 19 have at least one member of the family taking instrumental music lessons in school. In 49 of the 93 homes, family members regularly sing or play music together, and 57 of the families attend musical shows or concerts at least once a year. (See accompanying illustration for additional information revealed by the survey.--Table 5.)

SELECTION OF MATERIALS USED

Focal point of this study was a standard motion picture screen and a Bell and Howell standard overhead projector. In making overlays 8½ by 11 inch sheets of clear acetate and 1 inch masking tape were used. Both are commercially obtainable. Illustrations were drawn using felt or nylon-tipped pens in various colors, and crayons or grease pencils, also in various colors.

Overlays were created especially for this study. Overlay 1 revealed only the 5 lines of the staff. Part 1-A, which was taped to the bottom of overlay 1, for easy placement, revealed the treble clef and its position on the staff. Part 1-B, which was taped to the right side of overlay 1, illustrated notes on the lines of the staff and their

letter-names, and part 1-C, which was taped to the left side of overlay 1, revealed notes on the spaces of the staff with their respective letter names.

Overlay 2 illustrated the staff, treble clef, bar lines and the double bar, which occurs at the end of each musical piece. Part 2-A, which was taped to the bottom of overlay 2, illustrated the $\frac{4}{4}$ time signature and the concept of the upper 4 indicating 4 beats to a measure and the lower 4 indicating the quarter note gets one beat. Part 2-B, which was taped to the right side of overlay 2, illustrated a whole note with its value of 4 beats, and 2 half notes, with values of 2 beats each being equal to one whole note. Part 2-C, which was taped to the left side of overlay 2, indicated quarter notes, equal to one beat each, and quarter rests, also equal to one beat each and their value relationships to the other notes.

With control groups the same concepts and illustrations were presented, using s standard portable music chalkboard with staff lines imprinted on it, along with white chalkboard chalk.

Test questions were adapted from TEMAC Programmed Learning Materials: Musical Notation by Batcheller.[1]

METHODS AND PROCEDURES USED

As part of the introduction of the unit, the experiment was explained to the 93 lower intermediate subjects. Description of what would be undertaken in the ensuing weeks followed. Reasons for the experiment were detailed. Students accept innovations in a more positive manner when they are given an overview.

Music in the subjects' environments was discussed. Upon reflection, subjects became aware of their personal involvement with music, and that of other members of their families. An affective survey was then administered to each of the 93 subjects. Since subjects indicated interest in the outcome, tabulations and results were discussed. Consensus among subjects was that all were more involved with music than they had realized.

A pre-test was administered next, and results recorded. (See Tables 6 through 9.) The technique of pre-testing did not seem familiar to the students, and they

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[1]John Batcheller, TEMAC Programmed Learning Materials: Musical Notation (New York: Encyclopaedia Britannica Press, 1964).

indicated dismay at inability to answer test questions. A review of answers after the test helped to some extent, but consensus among subjects was decidedly not in favor of pre-tests.

Experimental groups then began a course of exposure to fundamentals of music notation by observing the projection of overlays. Opportunity was provided to copy configuration of the treble clef, and to practice drawing notes on the staff. Emphasis was placed on numbers of lines and spaces on the staff, with their respective letter names.

The concept of $\frac{4}{4}$ time and note values was likewise introduced. Recognition of notes and their respective values was not difficult for subjects, but the concept of $\frac{4}{4}$ time was. It would appear that a greater length of time of exposure to the latter concept than this study provided is necessary for full comprehension.

Control groups were taught the same concepts, but illustrations were drawn on chalkboard, beginning with an explanation of the staff,, its numbers of lines and spaces, and their respective letter names. The concepts of bar lines and a double bar at the end of each musical piece were then introduced. The whole note, with its value of 4 beats was next presented, along with an illustration of 2 half notes, with value of 2 beats each, being equal to one whole

note. Quarter notes and quarter rests with a value of one beat each were shown next, along with their value relationship to other notes.

Subjects were provided with music manuscript paper with staffs imprinted, and pencils. (See Figure 5.) Students' manuscript papers were pinned into music folders which subjects made using 9X12 inch sheets of commercial oak tag board and staples. At conclusion of unit, subjects were given their music folders to keep.

LIMITATIONS OF STUDY

Though the experiment proved worthwhile to all concerned, subjects and investigator alike, its findings and conclusions are subject to a number of limitations.

Class sizes are relatively small, averaging somewhat less than 25 subjects per class for a subject total of 93. Although that number is small, it represented the best grouping available for experimentation. Subjects are divided into four classes, two of which were used for experimentation, with music notation lessons taught using overhead projection, and two of which were used as control groups, and taught music notation using chalkboard and chalk.

Frequency -- or infrequency -- of meeting presented another limitation. Classes are scheduled to meet once each week for a 40 minute period. However, since the study was conducted in the Autumn of the year, it was subject to a number of school holidays. The convention of the New Jersey Education Association, Thanksgiving recess, and one teacher absence resulted in a number of class meetings being missed. This placed further limitations on the study.

Once-weekly music classes in elementary education are a limitation in themselves, since there are many areas of music to be covered, and but one 40 minute period in which to cover them. Singing is most important, and is sorely missed, by student and teacher alike, if not done each week. The same is true for listening or appreciation, rhythm games and a number of other areas of the elementary music curriculum. With the exigency of satisfying these musical needs, only a portion of the weekly 40 minute music period could be devoted to the overhead projector vs. chalkboard experiment in teaching music notation.

Weather during the duration of the experiment was remarkably consistent, for the most part being fair and cold. It seemed to have little effect on subjects. However, anticipation of holidays, report cards and other local events seemed to have a greater effect on behavior,

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ability to concentrate, and general interest in the experiment.

Class interruptions, students being called to office or nurse, notes sent in to teacher, fire drills and other disruptions appeared to have little effect on either subjects or teacher. Progress was good, work seemed to continue despite a number of these minor interruptions.

It should also be noted that not infrequently special education students are subject to emotional upsets, which prevent the students from concentrating and comprehending. Such an occasion arose once during the experiment and limited the student's absorption of that day's lesson, although it proved but a minor interruption to all other subjects.

ASSUMPTIONS

For the purpose of this study, it is assumed if a child is in school, he is physically well enough to learn. It is assumed all have normal hearing and vision. It is further assumed that a child is emotionally well enough to learn.

By using standardized programmed learning materials and tests it is assumed the latter are a suitable complement to the former; that concepts to be taught are valid, and

that testing instruments thereof are likewise valid.

SUMMARY

Purpose of the study is to compare use of overhead projection and chalkboard in teaching of music notation. Subjects selected for study include four lower intermediate classes from Heights School, Oakland, New Jersey; two of which were used as experimental groups, and two of which were used as control groups.

A 5 week unit on music notation was pursued, beginning with a survey of music in homes of the 93 subjects, and subjects' individual musical tastes. Consensus was all were more involved with music than they had realized.

A pre-test was administered, surveying subjects' knowledge of principles of music staff and notation, if any. Ensuing meetings dealt with introduction of musical staff, treble clef, notes and note values, using overhead projection with experimental groups and chalkboard and chalk with control groups.

A post-test was administered at conclusion of the unit. Records of attendance, weather and interruptions were kept, and are included herewith, along with pre-test, and post-test and mean scores.

FIGURE 1

LESSON PLAN: MUSIC NOTATION UNIT

WEEK 1

OBJECTIVE: To make subjects aware of music in their own environment, their personal involvement with it, and the involvement of other members of their families with music.

MATERIALS: Affective survey questionnaire on music in the home. (See Table 5.)

PROCEDURE: Discuss music as it occurs in the home, encourage each member of class to think about how many instruments there are at home, how many family members sing or play music, how many take music lessons, etc. Administer survey questionnaire. Tabulate results and discuss with subjects.

EVALUATION: Very worthwhile activity. Consensus among subjects is that they and their families are more involved with music than they had realized.

FIGURE 2

LESSON PLAN: MUSIC NOTATION UNIT

WEEK 2

OBJECTIVE: To survey subjects' knowledge of music notation fundamentals by administration of pre-test.

MATERIALS: Pre-test adapted from TEMAC Programmed Learning Materials: music notation.[2]

PROCEDURE: Explain purpose of pre-test. Administer pre-test. Collect papers. Review test answers, using overhead projector to project answers with experimental groups, and using chalkboard and chalk to indicate answers with control groups.

EVALUATION: Reactions not favorable. Most subjects seemed never to have experienced a pre-test, and were dismayed at their inability to answer questions. Review of answers helped, but consensus was "Why didn't you teach us this material before the test?"

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[2]Batcheller, Op. cit.

FIGURE 3

MUSIC STAFF AND NOTATION TEST 1

Name _____.

1. How many lines make a musical staff? _____.
2. The clef (𝄞) is called the _____ clef.
3. The note with the greatest value is the whole note. (𝅝) It gets _____ beats.
4. The half note (𝅗𝅥) gets _____ beats.
5. The quarter note (♩) gets _____ beat.
6. Names of the lines on the treble staff are _____, _____, _____, _____, and _____.
7. Names of the spaces on the treble staff are _____, _____, _____, and _____.
8. Music is divided into measures or bars by using _____ lines.
9. In $\frac{4}{4}$ time the top 4 means _____ beats to a measure and the bottom 4 means a _____ note gets one beat.
10. A musical sound is indicated by a _____ and a silence is indicated by a _____.

FIGURE 4

LESSON PLAN: MUSIC NOTATION UNIT

WEEK 3

OBJECTIVE: To teach concept of 5 line staff, treble clef, names of lines and spaces.

MATERIALS: Overlay 1 with experimental groups, chalkboard and chalk with control groups. Music manuscript paper and pencils for students.

PROCEDURE: Introduce staff. Introduce treble clef and show its position on staff. Let students practice making treble clefs. Introduce names of lines and spaces. Let students copy same on manuscript paper. Conduct short oral review on names of lines and spaces.

EVALUATION: Generally successful. TEMAC Programmed Learning Materials: Music Notation[3] stresses fundamentals, such as numbers of lines and numbers of spaces; students learned the lesson well.

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[3]Batcheller, Op. cit.

FIGURE 5

SAMPLE OF MUSIC MANUSCRIPT PAPER

USED BY SUBJECTS

FIGURE 6

OVERLAY 1

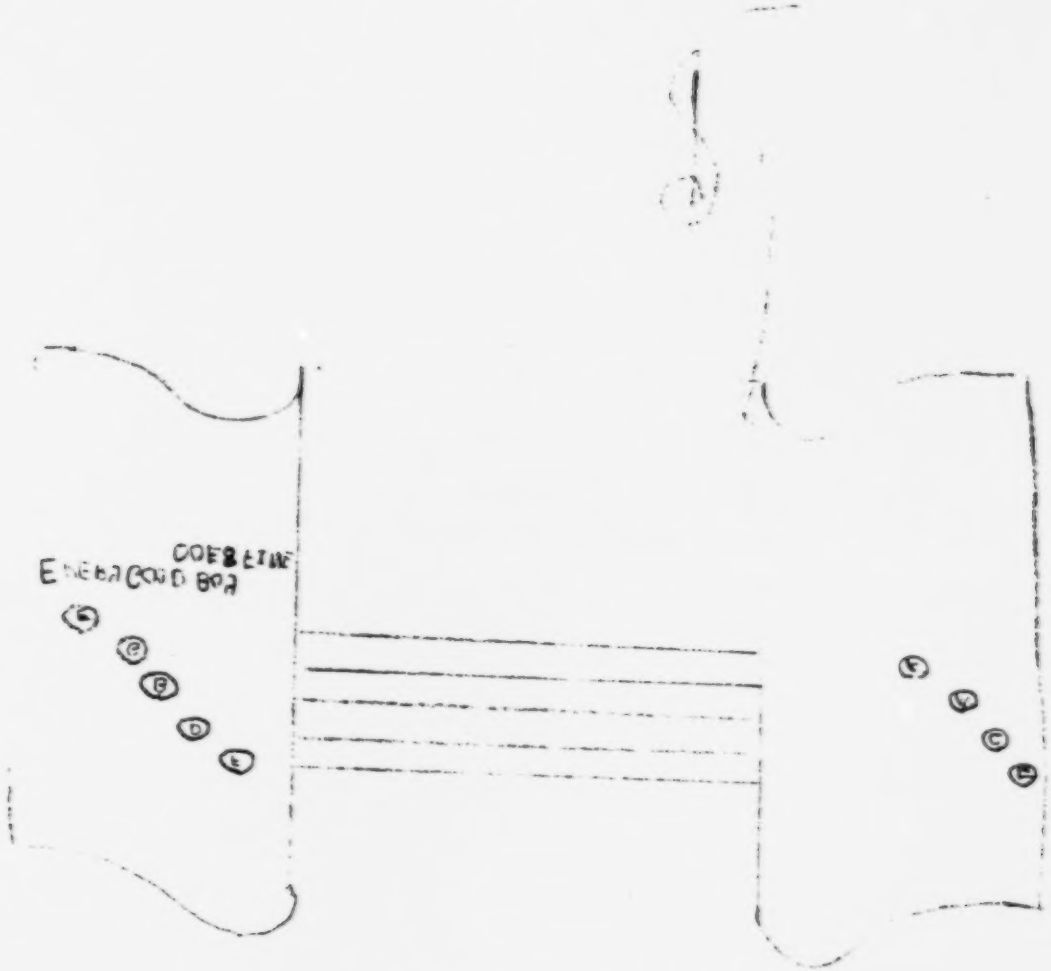

FIGURE 1

LESSON PLAN: MUSIC NOTATION UNIT

WEEK 4

OBJECTIVE: To teach concept of music in meter, $\frac{4}{4}$ time, bar lines, whole notes, half notes and quarter notes.

MATERIALS: Overlay 2 with experimental groups, chalkboard and chalk with control groups. Music manuscript paper and pencils for students.

PROCEDURE: Introduce concept of music in meter by indicating bar lines on music staff, and double bar at end of exercise. Introduce $\frac{4}{4}$ time, whole note and its value of 4 beats. Introduce half note and quarter note and their respective values of 2 beats and one beat.

EVALUATION: Notes and values were grasped easily but the concept of $\frac{4}{4}$ time proved difficult to understand.

FIGURE 8

OVERLAY 2

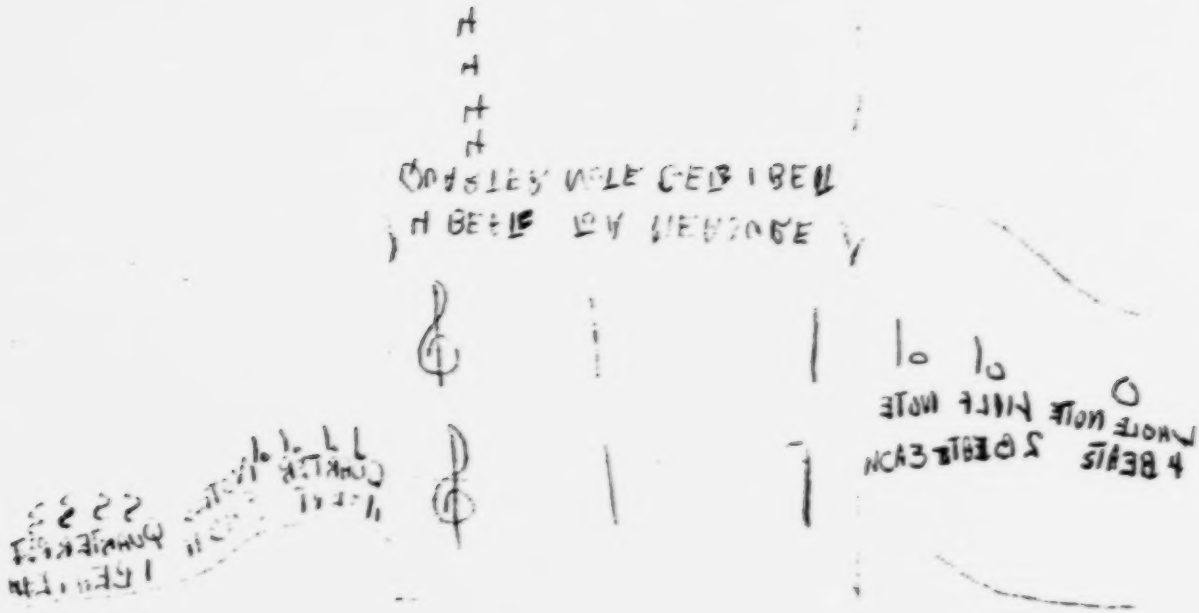

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FIGURE 9

LESSON PLAN: MUSIC NOTATION UNIT

WEEK 5

OBJECTIVE: To summarize unit and administer post-test.

MATERIALS: Post-test adapted from TEMAC Programmed Learning Materials: Music Notation.[4]

PROCEDURE: Explain purpose of post-test. Administer post-test. Collect papers. Review test answers, using overhead projector with experimental groups, and chalkboard and chalk with control groups.

EVALUATION: Students and teacher generally satisfied with unit, though some concepts need more time and exposure to be fully comprehended.

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[4]Batcheller, Op. cit.

FIGURE 10

MUSIC STAFF AND NOTATION TEST 2

Name _____.

1. A musical sound is indicated by a _____ and a silence is indicated by a _____.

2. _____ lines separate the music into measures.

3. The clef is called the _____ clef.

4. The note with the value of 4 beats is the _____ note.

5. The note with the value of 2 beats is the _____ note.

6. How many beats does a quarter note get? _____.

7. The names of the lines of the staff are _____, _____, _____, _____, and _____.

8. The spaces are _____, _____, _____, and _____.

9. Two bar lines at the end of a piece are called a _____ _____.

10. Music is written on music _____ paper.

Chapter 4

ANALYSIS OF DATA

This chapter analyzes data gathered during the experiment to determine advantages, if any, in use of overhead projection as opposed to chalkboard in teaching of music notation. A study was conducted using four lower intermediate classes, with two functioning as experimental groups and two functioning as control groups. A total of 93 subjects participated.

A survey of musical interest was administered, followed by a pre-test of knowledge of music notation fundamentals. In the ensuing weeks a unit in music notation was taught, familiarizing students with the concepts of the musical staff, treble clef, $\frac{4}{4}$ time, bar lines, names of the lines and spaces, etc.

With experimental groups, overhead projection was used, with acetate overlays created especially for this study. The same basic concepts of music notation were taught to control groups, using the conventional method of drawing musical concepts on the chalkboard.

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At close of the unit, a post-test was administered. Results, comparisons and analysis of data thus obtained will be discussed in this chapter.

RESULTS OF AFFECTIVE SURVEY

At the outset of this study, a survey of musical interest and awareness was conducted. (See Table 5.) Results of the survey indicate of the 93 homes represented, 45 have a piano or organ, in at least 43 homes it is played regularly, 55 homes have members of the family who play other instruments, 17 homes have members of the family who play in bands or orchestras, 27 homes have members of the family who sing regularly in choirs or other singing groups, 72 homes have phonographs which are used regularly to hear music, 81 homes have television sets on which musical programs are watched regularly, and 86 homes regularly use the radio to listen to music. Of the 93 homes, 33 have at least one member of the family studying music privately, and 19 have at least one member of the family taking instrumental music lessons in school.

In 49 of the 93 homes, family members regularly sing or play music together, and 57 of the families attend musical concerts or shows at least once a year.

Additional information revealed by the survey indicates most students like most aspects of music, although some more than others. Of the 93 subjects surveyed, 65 indicated strong preference for listening to records, 17 indicated moderate preference for listening to records, and none indicated a dislike for listening to records. Most indicated a strong preference for singing activities of various kinds, and preferences ran in favor of other musical activities.

Though these various areas of musical tastes and preferences were included in the survey, they are not necessarily related to the specifics of this study. Results of the musical tastes portion of the survey are most interesting, however, and suggest a worthwhile area for analysis in a future study.

FINDINGS RELATED TO ATTENDANCE, WEATHER AND INTERRUPTIONS

For the duration of this experiment, conducted during the Autumn of the year 1970, student attendance was quite regular and reliable, ranging from 85% to 100% per meeting, averaging about 95%. (See Tables 1 through 4.) During the term of this study, however, one subject did move away, and another was hospitalized halfway through the unit,

and thus did not participate in the rest of the unit or the post-test.

Weather during the time the experiment was conducted was remarkably consistent, for the most part being fair and cold, much colder than normal, for this part of the country at this time of year. Rather than having a negative effect on subjects, cold weather appeared to put them in a "Winter" frame of mind, in which they are more receptive to routine.

However, anticipation of holidays, report cards and other local events had a greater effect on behavior, ability to concentrate, and general interest in the experiment. Day to day fluctuations could be noticed, due to these events.

Since this study was conducted in the Autumn, it was subject to a number of interruptions due to the school schedule of holidays and other events. The convention of the New Jersey Education Association in early November accounted for two days' closing of school. Thanksgiving recess accounted for another closing of two days. These events and one teacher absence meant a number of interruptions to regular weekly meetings of both experimental and control groups. Since classes normally meet once each week, a missed meeting means two weeks until the next, and often in that duration, students forget material taught in the previous meeting.

In this case, however, classes appeared to be able to pick up where they left off and continue with the unit on music notation with a minimum of confusion and forgetting. The aforementioned interruptions in the school schedule appeared to have little detrimental effect, if any.

A number of minor class interruptions did occur during the period of experimentation: students called to office or nurse, notes sent to teacher, fire drills and other disruptions. However these appeared to have little effect on either subjects or teacher. Progress was good, and work continued despite a number of these minor interruptions

Because a number of special education students participated in this study, a note on their special situation should be included. Such students are often subject to physical and emotional upsets, which prevent the students from concentrating or comprehending. Such an occurrence arose only once during the experiment, and that in itself is remarkable. Moreover, though this particular incident did affect that student's absorption of the day's lesson, it proved to be but a monor interruption to the others, and they displayed a commendable showing of interest in subject and ability to concentrate, despite the breakdown and upset of their fellow student.

FINDINGS RELATED TO TEST SCORES

The unit on music notation used in this experiment was designed according to principles of educational technology; an overview of the unit was presented, a pre-test administered, the concepts to be learned were taught in sequence, and a post-test concluded the unit.

Results of the pre-test indicated a number of subjects had some prior knowledge of music notation. As mentioned earlier, there is music activity in many of the homes of subjects, and some subjects themselves are engaged in taking private music lessons. Therefore, indications of prior knowledge of music fundamentals on the pre-test were to be expected.

Three subjects of the 93 tested scored 80 of a possible 100 on the pre-test, while one scored 90 on the same test. Most scores were in the 20-50 range, indicating some knowledge of music notation, while 37 of the 93 subjects, or approximately 39% scored 0, indicating no prior knowledge of music notation, or a lack of ability to perform the test itself.

Before discussing post-test scores, some further notes on special education subjects are in order. Those special education subjects who participated in this

experiment are diagnosed as neurologically impaired. This means these subjects suffer from reading disabilities; perceptual impairments, such as inability to distinguish a half note from a quarter note; poor memory; and lack of ability to assimilate, integrate, and reproduce information. Such characteristics interfere with special education subjects' performance in learning, and also in working with such a detailed study as music notation. Moreover, written tests are a source of anxiety to these students, more so than with other students.

While exposure to the unit on music notation did some good for these subjects, a written test did not prove to be a suitable measure in their case, for the above-mentioned reasons. However it is reasonable to assume these subjects will have some long-term recall of the subject matter.

Because of the effect of special education subjects' test scores on the means, two sets of test scores are included for groups in which special education subjects participated. Tables 6 through 9 show pre-test and post-test scores of all subjects, including those in special education. Tables 10 through 12 show pre-test and post-test scores excluding those of the special education group. Mean scores will be noticeably higher on tables which exclude the

special education subjects.

Tables 6 through 9 including special education subjects reveal an averaged mean score of 18.92% of a possible 100% on pre-test for experimental groups, and an averaged mean score of 18.01% of a possible 100% on pre-test for control groups.

Post-test results, inclusive of those of special education subjects reveal an averaged mean score of 76.75% of a possible 100% for experimental groups and an averaged mean score of 87.61% of a possible 100% for control groups. The average percentage increase for those in experimental groups was 306%, while the average percentage increase for those in control groups was 386%.

Exclusion of scores of special education subjects (Tables 10 through 12) reveals an averaged mean score of 23.81% of a possible 100% on pre-test for experimental groups and an averaged mean score of 18.46% of a possible 100% on pre-test for control groups.

Post-test results, excluding those of special education subjects, show an averaged mean score of 92.75% of a possible 100% for experimental groups and 89.47% of a possible 100% for control groups. Not including special education subjects, an averaged mean increase of 290% can be noted for those in the experimental groups while those in

control groups showed an averaged mean increase of 385%.

Findings Related to Major Hypothesis

Aforementioned averaged mean percentage increases indicate that control groups achieved greater increases on post-tests than did the experimental groups. From these indications, it would appear that for the purpose of teaching music notation fundamentals, the chalkboard is superior to overhead projection. Thus the major hypothesis of this study is rejected.

Findings Related to Minor Hypothesis

The minor hypothesis of this study stated that subjects taught the musical staff, treble clef, notes and note values with overhead projection would retain knowledge and score higher on standardized music tests than those subjects taught the same material using the chalkboard. Time does not permit evaluation of long-term recall, but percentages of improvements on post-tests did clearly indicate control groups, who were taught music notation fundamentals on chalkboard did make greater increases in knowledge than those subjects in the experimental group, who were taught the same subject matter using overhead projection.

SUMMARY

Data gathered during this experiment in teaching music notation fundamentals via overhead projection as opposed to chalkboard included: class attendance during the experimental period; findings related to attendance, weather and interruptions; results of an affective survey on music in the home and musical tastes of subjects used in this experiment; and findings related to pre and post-test scores.

Because of various disabilities of special education students who were included in the experiment, test scores were analyzed twice, including scores of special education students, (Tables 6 through 9) and excluding scores of special education students (Tables 10 through 12).

Mean percentages of increases were averaged for the two experimental groups and for the two control groups. Percentages of increases were greater in all cases for control groups rather than for experimental groups.

Therefore, the major and minor hypotheses of this study are rejected; for the purpose of teaching music notation fundamentals, the chalkboard appears superior to the overhead projection method.

Tables 1 through 4 indicate attendance, absences of subjects and teacher, and weather on each day of class. Prefix X indicates experimental group, and C indicates control group. Suffix M indicates male subject, and F indicates female subject. Prefix S indicates special education subject and suffix T indicates special education subjects who are in music class twice per week. Initials K, S, M, and J are taken from surnames of respective class homeroom teachers. AB indicates absence and MO indicates subject moved.

TABLE 1

ATTENDANCE OF XR GROUP

	11/1/76	11/8/76	11/15/76	11/22/76	11/29/76	12/6/76
Weather	Fair Cold		Cloudy Cool	Fair Cold	Cloudy Cold	Clear Cold
XR-1-M	AB	T				
XR-2-M		E				
XR-3-M		A				
XR-4-M		C				
XR-5-M		H				
XR-6-M		E				
XR-7-M		R				
XR-8-SMT						
XR-9-M		A				
XR-10-M		B				
XR-11-SMT		S				
XR-1-F		E				
XR-2-F		N				
XR-3-F		T		AB		
XR-4-F						
XR-5-F						
XR-6-F						
XR-7-F						
XR-8-F						
XR-9-F						
XR-10-F						
XR-11-F						
XR-12-F						

TABLE 2

ATTENDANCE OF SC GROUP

	10/27/76	11/10/76	11/17/76	11/24/76	12/1/76	12/8/76*
Weather	Fair Cold	Cloudy Cold	Clear Cold	Clear Cold	Clear Cold	Cloudy Cold
SC-1-M						
SC-2-M						
SC-3-M						
SC-4-M						
SC-5-M						
SC-6-M						
SC-7-M	AB	AB				
SC-8-M			AB	AB	AB	AB
SC-9-M				AB		
SC-1-F						
SC-2-F						
SC-3-F						
SC-4-F						
SC-5-F	AB					
SC-6-F						
SC-7-F						AB
SC-8-F						
SC-9-F	AB					
SC-10-F						
SC-11-F						
SC-12-F						
SC-13-F						

*Note: 11/3/76 school holiday. Class did not meet.

TABLE 3

ATTENDANCE OF MC GROUP

	10/29/76	11/12/76	11/19/76	12/3/76	12/10/76*
Weather	Fair Cold	Fair Cold	Fair Cool	Clear Cold	Clear Moderate
MC-1-M					
MC-2-M					
MC-3-M					
MC-4-M					
MC-5-M					
MC-6-M			AB		
MC-7-M					
MC-8-M					
MC-1-F					
MC-2-F					
MC-3-F			AB		
MC-4-F					
MC-5-F					
MC-6-F					AB
MC-7-F					
MC-8-F					
MC-9-F					
MC-10-F					
MC-11-F					
MC-12-F					

*Note: 11/5/76 and 11/26/76 school holidays. Class did not meet.

TABLE 4

ATTENDANCE OF XJ GROUP

	10/29/76	11/12/76	11/19/76	12/3/76	12/10/76*
Weather	Fair Cold	Fair Cold	Fair Cool	Clear Cold	
XJ-1-M					
XJ-2-M		AB			
XJ-3-M					
XJ-4-M					
XJ-5-M					
XJ-6-M					AB
XJ-7-M					
XJ-8-M					
XJ-9-M					
XJ-10-M					
XJ-11-M			AB		
XJ-12-SM					AB
XJ-13-SM			AB		
XJ-14-SM					
XJ-15-SM					
XJ-16-SM					
XJ-17-SM					
XJ-18-SM				MO	MO
XJ-1-F					
XJ-2-F					
XJ-3-F					
XJ-4-F					
XJ-5-F					
XJ-6-F					
XJ-7-F					
XJ-8-F					
XJ-9-F					
XJ-10-F					

*Note: 11/5/76 and 11/26/76 school holidays. Class did not meet.

TABLE)

MUSIC SURVEY

Music is a great part of our lives. We find it all around us. It can make us feel happy, sad, thoughtful, excited and much more. Help us to learn more about how you and your family feel about music by answering the following questions.

1. Do you have a piano or organ at home?	45
2. How many members of your family play it?	43
3. How many members of your family play another instrument?	55
4. How many members of your family take music lessons privately?	33
5. How many members of your family take lessons on an instrument in school?	19
6. How many members of your family belong to a band or orchestra?	17
7. How many members of your family belong to a choir or other singing group?	27
8. Do you and your family ever sing or play music together?	49
9. would you like to join a band, orchestra or singing group?	57
10. Does your family have a phonograph or tape player on which you play music regularly?	72
11. Does your family watch musical programs on TV?	81
12. Does your family listen to music on the radio?	86
13. How many times a year do you and your family attend concerts or musical plays?	57

This survey administered to 93 subjects.

TABLE 5 (continued)

MUSICAL TASTES

Because music is so varied, many people like some aspects more than others. For example, some like to sing, some like to play instruments, some like to listen and some like to do all three.

In the following, check the box that suits you most:

	LIKE VERY MUCH	LIKE	DON'T LIKE
Listen to records	65	17	0
Read while listening	19	32	41
Draw pictures while listening	34	43	10
Sing along with records	46	22	22
Hear someone play an instrument	41	31	12
Sing along when someone plays	41	26	19
Sing songs with a group of friends	28	20	41
Join a band or singing group	41	29	19
Practice an instrument	48	23	18
Learn how music is put together	21	36	31
Stories of music classics	33	36	14
Stories about music and musicians	43	34	8
Musical games	48	18	19
Have a part in a musical play	51	13	17

TABLE 6

TEST SCORES OF GROUP XR

SUBJECT	PRE-TEST	POST-TEST
	Possible score 100	Possible score 100
XR-1-M	0	10
XR-2-M	0	100
XR-3-M	10	100
XR-4-M	0	80
XR-5-M	10	50
XR-6-M	0	80
XR-7-M	0	100
XR-8-SMT	0	20
XR-9-M	0	100
XR-10-M	10	100
XR-11-SMT	0	0
XR-1-F	0	90
XR-2-F	40	100
XR-3-F	50	100
XR-4-F	40	100
XR-5-F	20	100
XR-6-F	20	100
XR-7-F	0	100
XR-8-F	0	100
XR-9-F	0	100
XR-10-F	20	100
XR-11-F	50	100
XR-12-F	30	100
Mean Score	13.04	83.91

TABLE 7

TEST SCORES OF GROUP SC

SUBJECT	PRE-TEST	POST-TEST
	Possible score 100	Possible score 100
SC-1-M	0	90
SC-2-M	10	100
SC-3-M	10	90
SC-4-M	60	100
SC-5-M	0	100
SC-6-M	20	100
SC-7-M	AB	100
SC-8-M	0	AB
SC-9-SM	0	20
SC-1-F	0	100
SC-2-F	10	70
SC-3-F	10	100
SC-4-F	10	100
SC-5-F	20	100
SC-6-F	20	100
SC-7-F	20	AB
SC-8-F	60	90
SC-9-F	0	100
SC-10-F	20	100
SC-11-F	40	100
SC-12-F	30	80
SC-13-F	30	70
Mean Score	17.61	90.50

TABLE E

TEST SCORES OF GROUP MC

SUBJECT	PRE-TEST	POST-TEST
	Possible score 100	Possible score 100
MC-1-M	20	20
MC-2-M	80	100
MC-3-M	0	80
MC-4-M	0	70
MC-5-M	10	100
MC-6-M	0	100
MC-7-M	0	90
MC-8-M	40	100
MC-1-F	40	100
MC-2-F	30	100
MC-3-F	20	100
MC-4-F	0	100
MC-5-F	30	100
MC-6-F	0	AB
MC-7-F	0	40
MC-8-F	0	60
MC-9-F	30	100
MC-10-F	50	100
MC-11-F	0	50
MC-12-F	0	100
Mean Score	18.42	84.73

TABLE 9

TEST SCORES OF GROUP XJ

SUBJECT	PRE-TEST	POST-TEST
	Possible score 100	Possible score 100
XJ-1-M	0	40
XJ-2-M	AB	100
XJ-3-M	20	100
XJ-4-M	80	100
XJ-5-M	0	50
XJ-6-M	0	AB
XJ-7-M	60	100
XJ-8-M	90	100
XJ-9-M	30	100
XJ-10-M	0	80
XJ-11-M	10	30
XJ-12-SM	0	AB
XJ-13-SM	0	0
XJ-14-SM	0	0
XJ-15-SM	0	30
XJ-16-SM	0	0
XJ-17-SM	0	0
XJ-18-SM	AB	MO
XJ-1-F	40	100
XJ-2-F	10	50
XJ-3-F	40	100
XJ-4-F	20	100
XJ-5-F	AB	100
XJ-6-F	30	100
XJ-7-F	30	100
XJ-8-F	50	100
XJ-9-F	30	100
XJ-10-F	80	100
Mean Score	24.80	69.60

TABLE 10

TEST SCORES OF GROUP AR EXCLUDING SPECIAL EDUCATION SUBJECTS

SUBJECT	PRE-TEST	POST-TEST
	Possible Score 100	Possible Score 100
XR-1-M	0	10
XR-2-M	0	100
XR-3-M	10	100
XR-4-M	0	80
XR-5-M	10	50
XR-6-M	0	80
XR-7-M	0	100
XR-9-M	0	100
XR-10-M	10	100
XR-1-F	0	90
XR-2-F	40	100
XR-3-F	50	100
XR-4-F	40	100
XR-5-F	20	100
XR-6-F	20	100
XR-7-F	0	100
XR-8-F	0	100
XR-10-F	20	100
XR-11-F	50	100
XR-12-F	30	100
Mean Score	15.00	90.50

TABLE 11

TEST SCORES OF GROUP SC EXCLUDING SPECIAL EDUCATION SUBJECTS

SUBJECT	PRE-TEST	POST-TEST
	Possible Score 100	Possible Score 100
SC-1-M	0	90
SC-2-M	10	100
SC-3-M	20	90
SC-4-M	50	100
SC-5-M	0	100
SC-6-M	20	100
SC-7-M	AB	100
SC-8-M	0	AB
SC-1-F	0	100
SC-2-F	10	70
SC-3-F	10	100
SC-4-F	10	100
SC-5-F	20	100
SC-6-F	20	100
SC-7-F	20	AB
SC-8-F	60	90
SC-9-F	0	100
SC-10-F	20	100
SC-11-F	40	100
SC-12-F	30	80
SC-13-F	30	70
Mean Score	18.50	94.21

TABLE 12

TEST SCORES OF GROUP XJ EXCLUDING SPECIAL EDUCATION SUBJECTS

SUBJECT	PRE-TEST	POST-TEST
	Possible Score 100	Possible Score 100
XJ-1-M	0	40
XJ-2-M	AB	100
XJ-3-M	20	100
XJ-4-M	80	100
XJ-5-M	0	50
XJ-6-M	0	AB
XJ-7-M	60	100
XJ-8-M	90	100
XJ-9-M	30	100
XJ-10-M	0	80
XJ-11-M	10	30
XJ-1-F	40	100
XJ-2-F	10	50
XJ-3-F	40	100
XJ-4-F	20	100
XJ-5-F	AB	100
XJ-6-F	30	100
XJ-7-F	30	100
XJ-8-F	50	80
XJ-9-F	30	100
XJ-10-F	80	100
Mean Score	32.63	95.00

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Chapter 5

SUMMARY, CONCLUSIONS AND IMPLICATIONS

This experiment in teaching a unit on music notation fundamentals using overhead projection as opposed to chalkboard proved most interesting and informative for subjects, investigator and associates. Rejection of hypotheses was unexpected, but these results gave rise to new insights into the use and effectiveness of audio-visual equipment.

Findings Related to Major Hypothesis

Despite limitations of this study, a pattern emerged which indicated overhead projection may not be best in instruction of music notation fundamentals. In presenting a picture already finished, students did not get to see the creation of the particular signs and symbols, and therefore felt they were not shown "How to" do it. The acual demonstration of drawing the staff, drawing the treble clef, and drawing notes was important in showing students how to do it.

Whereas it is possible to draw images on acetate sheets while they are being projected, it is difficult on the type of projector in common use, because the demonstrator must look directly into the projection light of 500 watts power. On at least one occasion it left the investigator with a severe headache.

Students need to be shown how to draw the various items over and over in different ways. For this purpose the chalkboard is superior because it can be drawn upon directly in view of the students, can be quickly erased, and can be used to show many different ways of accomplishing the same musical basics.

A standard portable music chalkboard with six sets of staff lines permanently painted on, can be used as a replica of the students' manuscript paper, which also has six sets of staff lines, and students can copy exactly what the teacher indicates on the chalkboard, step by step.

Conversely, the usual school-type overhead projectors can only indicate two sets of staff lines at a time, in order to be clearly focused. More can be shown, but images are smaller, and harder for students to follow. Likewise, overhead projection of sufficient size and clarity permits only two bars width of music at a time, whereas the chalkboard can reveal four or more bars across

and six staffs down all at once, showing an entire page of music manuscript work at a time, all or any part of which can be clearly seen, comprehended and copied by students.

Though both overhead projection and the chalkboard are most useful and efficient visual aids for teaching in virtually every field of study, this experiment indicates, contrary to the statement of major hypothesis, that the chalkboard is preferable to overhead projection in teaching of fundamentals of music notation.

Findings Related to Minor Hypothesis

A comparison of averaged mean percentages of increase in knowledge of the subject indicated greater growth for those in control groups than for those in experimental groups. Therefore the minor hypothesis of this study, that subjects taught music notation fundamentals with overhead projection would retain knowledge and score higher on standardized tests is rejected. Students in control groups not only made greater increases in mean scores between pre-test and post-test, but indicated a greater familiarity with subject matter and a greater ease in working with it. Subjects in experimental groups appeared stiffer and a bit doubtful in doing music manuscript exercises on paper.

Comparison of Findings with Earlier Research

In this study comparing overhead projection with other teaching methods in economics, Porreca[1] states that few classroom teaching materials are used extensively because they are expensive and in many instances teachers are not adequately prepared to use them. While this may be true, the problem presented to the teacher is to find the best medium for the purpose, considering subject matter to be taught; subjects to whom it is to be taught, their ages and intellectual levels; expense of equipment, and practicality in its utilization.

Studies cited in Chapter 2 of this report dealt with overhead projection usage on secondary and college levels. Little experimentation, if any at all, could be found in the usual sources dealing with overhead projection experiments on an elementary level.

Despite its limitations, this study indicates that overhead projection is too sophisticated a tool for teaching something as elementary as how to draw the music staff, treble clef, notes and bar lines.

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[1]Porreca, op. cit., p. 14.

The overhead projector "assumes" too much for this purpose. It assumes students need only to be shown a picture and they can reproduce it. It assumes that from showing students a few bars of music they can visualize these few bars as part of a greater picture, a whole page of music manuscript. Secondary and college students, may be able to do this, since they are usually older and of higher intellectual levels. However, it is not so on the elementary level.

Elementary subjects in music notation demonstrations need to be shown, step-by-step, inch-by-inch, how the staff, treble clef and notes are drawn and shaped. For this purpose the chalkboard at the front of a music classroom is more effective, since the teacher draws images directly before the eyes of his subjects. It is the next best thing to sitting side by side with students and drawing the images on paper, one-to-one, with each individual student. Overhead projection does have many useful applications in elementary education, but this study indicates that introducing music notation is not one of them.

ANCILLARY FINDINGS

Perhaps the most significant of the unexpected findings this investigation revealed was student interest in the study itself. In response to a number of questions asked by subjects in both experimental and control groups, an overview of the entire experiment was presented: why it was being done; its projected results; and where, ultimately, it might be presented. Because of this interest, the entire plan of the investigation was thoroughly discussed with subjects, and as a result, their interest and participation was greater.

At the outset of this study a survey of music in the home and individual musical tastes and preferences was conducted, (see Table 5). This survey revealed much data not necessarily related to the specifics of this study. But among unexpected results, subjects themselves were surprised to discover there was more music in their homes than they had realized, and that they, individually, were much more involved with it.

Principles of modern educational technology indicate a unit of knowledge should be approached by administering a pre-test, teaching the material to be mastered in sequence, administering a post-test, and comparing results

with those of the pre-test. Among other unexpected findings however, was anxiety and dismay on the part of students regarding the pre-test. They felt it was unfair to be asked to demonstrate a knowledge of certain facts and concepts when these facts and concepts had not been taught to them. The principle of the pre and post-test and the comparison to show improvement was explained, but consensus of subjects remained dissatisfaction with the pre-test concept. Therefore, it is conjectured that the pre and post-test approach may not be as suitable to the elementary level as it is to other levels of education.

IMPLICATIONS OF THE FINDINGS

In general research in audio-visual education and educational technology reveals more studies done in secondary and college levels than in the elementary level. The elementary teacher can interpret this fact in two ways; a) there is an open field for research and investigation of these subjects in the elementary area, or b) audio-visual education and educational technology are not as well suited to the elementary level as they are to other levels.

As to the specifics of this investigation, both the practice of teaching music notation concepts via overhead projection as opposed to teaching the same concepts using

chalkboard, and the comparison of test scores point in favor of usage of chalkboard. In showing elementary students how to draw something; the teacher's actual drawing of it before their eyes is more meaningful and easier for them to follow than the projection of an already finished picture, no matter how elaborate or detailed.

SUGGESTIONS FOR FURTHER RESEARCH

A great deal of data was revealed by the survey of music in the home and musical tastes administered at the outset of this investigation, (see Table 5). Among other facts, the survey revealed much data about participation in music-making by individuals within families, and family groups as a unit; and musical tastes and preferences of subjects. Investigation, correlation and interpretation of this data would make a most interesting and worthwhile future study.

Although this investigation rejected its major hypothesis, that overhead projection is superior to chalkboard in teaching of music notation fundamentals, the overhead projector is still an effective audio-visual tool in other areas of elementary education. However, most studies devoted to overhead projection have been conducted at the secondary or college levels. Thus it is clear more research

needs to be done on the effectiveness of overhead projection in elementary education.

Anxiety and dismay of students at the concept of a pre-test point toward another topic for investigation. The pre and post-test concepts are basic to modern educational technology, but they may not be as suited to the elementary as to other levels. This suggests still another area for future research.

CONCLUSION

Overhead projection is, in most cases, an effective audio-visual teaching technique. But in teaching fundamentals of music notation to elementary subjects, the chalkboark proved superior, according to this investigation. The chalkboard can be used to demonstrate step-by-step, inch-by-inch, the drawing of the staff, treble clef, notes and bar lines, whereas the overhead projector presents finished pictures. The chalkboard presents clearly a full page replica of the student's music manuscript paper, while the overhead projector reveals only a few bars at a time.

Comparisons of mean scores reveal chalkboard-taught subjects showed greater increases than subjects taught using overhead projection. It was also evident during actual classroom demonstrations themselves that the chalkboard was

more efficient. Students' ease in comprehension and absorption from the chalkboard was easy to observe, and to compare with difficulty students appeared to have in attempting to absorb the same concepts revealed by overhead projection.

This study, therefore, concludes that the chalkboard is superior to overhead projection in teaching elementary concepts of music notation.

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